



**American Water Works Association
Government Affairs Office**

"Dedicated to Safe Drinking Water"

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October 21, 1996

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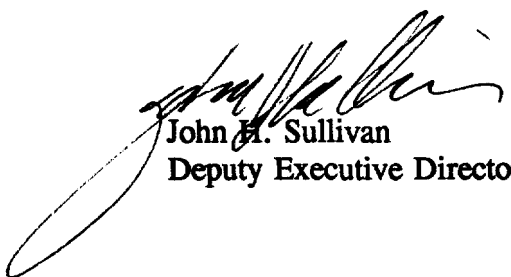
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**Re: Notice of Proposed Rule Making on Public Safety Radio Requirements Through the
Year 2010--WT Docket 96-86**

Dear Commission Members:

Enclosed are the comments from the American Water Works Association on the above notice of proposed rulemaking that was published in the *Federal Register* on May 20, 1996. If you have any questions on these comments, please feel to call myself or Alan Roberson in our Washington Office.

Yours sincerely,


John H. Sullivan
Deputy Executive Director

Enclosures

cc: Jon DeBoer
Alan Roberson
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**American Water Works Association
Final Written Comments on the May 20, 1996
Federal Communications Commission's (FCC's)
Notice of Proposed Rule Making on
Public Safety Radio Requirements Through the Year 2010
(61 FR 25185--WT Docket No. 96-86)**

I. INTRODUCTION

The American Water Works Association is pleased to have the opportunity to comment on the Notice of Proposed Rulemaking (NPRM) on the development of operational, technical, and spectrum requirements for meeting federal, state, and local public safety agency communications requirements through the year 2010. The American Water Works Association (AWWA) is an international, non-profit, scientific and educational society dedicated to the improvement of drinking water quality and supply. Founded in 1881, the Association is the largest organization of water supply professionals in the world. Our 55,000 plus members represent the full spectrum of the drinking water "community": treatment plant operators and managers, environmentalists, scientists, academicians, and others who hold a genuine interest in water supply and public health. Our membership includes approximately 3,700 public water suppliers which treat and distribute about 75 percent of the nation's drinking water.

The comments provided herein reflect the consensus of the AWWA, which, given the depth and breadth of its representation, also reflect the predominant view of the nation's public water systems (PWSs) and drinking water professionals. It is therefore appropriate that these AWWA comments be heard on behalf of the drinking water community in general.

These comments have been prepared with an intended spirit of cooperation. Only through an open sharing of expertise and information will the public's health be protected. With this in mind, we would like to recognize and acknowledge the Federal Communications Commission's (FCC's) openness to discuss and understand the issues surrounding this and other recent rulemakings. These comments are AWWA's first comments to the FCC on proposed rulemakings, and we look forward to continuing to work with the FCC so that the perspective of the drinking water community can be better understood by the Commission and their staff. These comments are organized with general comments on various telecommunications issues first, followed by specific comments that reference paragraphs in the Notice of Proposed Rule Making (NPRM).

II. GENERAL COMMENTS

We would also like to take this opportunity to inform the FCC of the operations of a typical public water system (PWS), and of their specific telecommunications needs. A PWS uses both voice and Supervisory Control and Data Acquisition (SCADA) telecommunications to treat and

distribute water. The operational facilities for a typical PWS, such as treatment plants and pumping stations, are scattered throughout a community. Yet all of these facilities and the entire distribution system (the water pipes in the ground) are interconnected. The same distribution system provides water for individual residences, fire hydrants, hospitals, dialysis centers, and businesses.

SCADA systems are critical to a PWS's operations. Depending on their configuration, SCADA systems can be used to control the scattered treatment and distribution systems. For example, SCADA systems are used to monitor water levels in storage tanks and distribution system pressure so that the proper pumps can be turned on to maintain adequate distribution system pressure. Another example of the use of SCADA system is for automated facilities, where the operations of one water treatment plant can be controlled at another water treatment plant.

The provision of water for firefighting by the PWSs is a public safety component that cannot be minimized. Public safety has been traditionally defined as "carrying a gun or a hose" for protection of life, property, or natural resources. But urban fire fighters cannot be effective without adequate water for fire fighting in the PWS distribution system. Distribution system pipe sizing is generally determined by fire flow requirements, i.e., a water main must be a certain size to provide a specific flow at a specific pressure in order to meet firefighting needs. Due to frictional losses in the pipe, a water main that is too small would not provide sufficient quantities of water for firefighting. In other words, distribution system pipe sizing is generally not based on normal usage from homes and businesses--it is based on the flow necessary to meet the peak flow requirements for fire fighting.

Another general issue of concern is the equitable distribution of limited spectral resources. Supervisory Control and Data Acquisition (SCADA) for water distribution and quality control utilizes digital communications for many facets of their operations. Water distribution and quality control is a public safety issue for the following reasons--not just a public service issue.

Fire fighting is vitally dependant on the availability of an adequate water supply, both quantity and pressure.

Continuous supply of water to hospitals and health centers is vital to human life.

Water transmission mains are not perfectly leak proof, and continuous pressure monitoring and control is necessary to protect against infiltration of contaminants to the water supply.

Therefore by definition, an adequate supply of quality water is essential to protect and preserve life, property, and natural resources.

Another general issue of concern is data versus voice communications. Public safety issues as discussed in this NPRM tend to focus on police and fire dispatch which primarily involves voice communications. Public water systems' (PWSs') functions which impact public safety also involve data communications (SCADA), not just voice based dispatch. Data and voice communications impose different requirement for system optimization. Voice communications

require real-time response, however, data can be prioritized and delivered at various times. There are sufficient needs for both voice and data concerning public safety to justify different systems allowing intermixing of both communications modes but optimized for one or the other. Based upon these requirements, we recommend that a portion of the public safety spectrum should be allocated for secure and optimal data transmission for PWS operations.

Another general area of concern is the prioritization of users. We note that this NPRM does not address the issue of prioritization of users within the public safety spectrum. We recommend that this issue be addressed as part of this step in the rule-making process. We do not believe that the present lottery, auction, or first come/first serve systems of allocating spectrum adequately serve the interest of public safety. Prioritization according to need should be part of the allocation process.

The overall focus of this NPRM is another general area of concern. This NPRM focuses on the issues of interagency communications and optimization of spectral usage which were brought to forefront by recent disasters and the flood of spectrum requests to the FCC to accommodate emerging technologies. These problems justify the restructuring of the public safety radio spectrum allocations, but this action should be viewed as an opportunity to address all known and anticipated problems in this services and not just a solution to current high-profile problems.

One future issue that should be addressed is the evolution to digital data communications. Presently the pressing need in the area of interagency communications is in the area of voice. In the future, interagency exchange of digital data may well become as important as voice. Consideration should also be given to providing additional frequency band for SCADA outside the 800 Mhz range, i.e., expand the band around 900 MHz. This provides the opportunity for improved efficiency in utilization of frequencies below 800 MHz.

Another general area of concern is the 92-235 Refarming Docket. While this NPRM focuses on the requirements in the year 2010, the reality is that the 92-235 refarming docket will require the impacted parties to relocate by the year 2000. FCC should consider how to coordinate these two dockets so that dual relocations can be avoided.

III. SPECIFIC COMMENTS

Comments regarding Public Safety Definition, paragraphs 24 & 25:

Public water supply clearly fits the definition of Public Safety as "protecting life, property, and natural resources..." as water is vital to fire suppression, public health (i.e. drinking water of high quality to hospitals, kidney dialysis clinics and other critical users in the community). Water systems depend on wireless communications for monitoring and control of:

- treatment plants
- pump stations
- distribution systems (and the distribution system pressure control)
- restoration of service in a natural disaster

Those public water suppliers operating their own surface water sources and watersheds carry an additional responsibility for flood control; hence the need for monitoring of remote weather stations, and control of:

- reservoir elevations
- reservoir releases
- hydroelectric stations
- water transmission facilities

These public safety functions extend beyond simple voice communications. Operation of a public water supply's Supervisory Control and Data Acquisition (SCADA) system is totally dependent on reliable high rate data communications which must remain secure from all other traffic.

The amount of water brought to the scene in the fire department tankers is adequate for only a few minutes of fire fighting. A Public Water System (PWS) must be able to manipulate pumps and valves that are usually remotely controlled such that adequate water supply can be directed to the fire area. The need for emergency manipulation of these pumps and valves is exacerbated when power utilities are disrupted because most PWSs do not have adequate standby power sources to maintain full service, i.e., most have standby power for partial service. Telephone lines frequently occupy the same utility poles as the power lines, and a downed pole would sever PWSs' communications when they are most needed.

SCADA system communications are almost entirely point-to-point or point-to-multipoint (i.e. fixed) or and therefore can be engineered for path reliability to make best use of the available spectrum. In many cases higher frequencies (900 MHz, and microwave) can provide sufficient communications reliability, but in some cases, due to terrain, lower frequencies will be the only way to provide reliable data communications for SCADA. These frequencies must be set aside to meet these needs in areas with uneven terrain.

Comments on Interoperability Needs, paragraph 29:

This paragraph, discusses Mutual Aid interoperability requirements. This appears to overlap with the FEMA Incident Command System (ICS), which defines a clear protocol and assignment of roles between multiple agencies responding to an incident. Development of wireless communications for interoperability should reflect the structure designed by FEMA. Water utilities have a clearly defined role in ICS.

Comments on Interoperability Options, paragraph 32:

To meet the interoperability requirements it is desirable that during an incident, a public water supply's voice communications be shared with other agencies on a shared multi-site trunked system. It should be noted that common frequencies and/or trunked systems are generally used in urban areas.

Wireless data communications are the primary means for a water system to manage a crisis. Voice communications are often a supplement, to be used when the "normal mode" of public water supply operation (via SCADA) fails.

Comments on Interoperability Options, paragraph 39:

This paragraph, discusses Mutual Aid interoperability requirements. Again, this appears to overlap with the Federal Emergency Management Agency (FEMA) Incident Command System (ICS), which defines a clear protocol and assignment of roles between multiple agencies responding to an incident. Development of wireless communications for interoperability should reflect the structure designed by FEMA. Water utilities have a clearly defined role in ICS.

Comments on Interoperability Options, paragraphs 40, 41 & 42:

AWWA supports the proposal to allocate spectrum solely for common communications modes and frequencies for use by public safety agencies in the event of a crisis, and further urge that spectrum be chosen in each geographic area to provide full coverage of that area. The chosen spectrum could be 800 MHz in those areas that have relatively flat terrain, whereas VHF would be necessary to assure full coverage in areas of more uneven terrain.

AWWA supports a requirement for all new public safety radio equipment sold to support the designated mutual aid/public safety channels. Existing equipment should be subject to a phase-in period of 3 to 5 years, however, a large capital expenditure to rebuild the communications system may not be possible within this window for some PWSs. The period for implementation should allow 7 years for compliance or consider a PWS in compliance if appropriate personnel have ready access to radios equipped with emergency channel monitoring capability.

Comments on System Requirements, paragraphs 51 & 55:

It should be noted that "...accommodation of the peak demand that occurs during multiple emergencies" was a real problem experienced in the Los Angeles area with the Whittier, Northridge, and the Landers quakes, fire storms, and riots. Historically, public carriers were unable to provide service levels which would meet the PWSs' needs. Having private primary, and often secondary, voice capability is essential. Systems designed to assist management of these peak urgent communications are needed. The dedicated common emergencies should include a regionally separate "hot line" frequency to be used to quickly coordinate multi-agency operations.

While it may seem reasonable to require public agencies to share emergency networks (and that is a goal of many PWSs), mandating that sharing may not achieve the desired results. It is better that agencies who have certain common basis of need be allowed to freely integrate their networks as possible. It would not seem proper to stack rescue operations on the same network as dam safety and highway departments. On the other hand, fire, police, and rescue for a large geographic area may have reason to communicate by sharing one or more common channels for coordination in major events.

Comments on Technology Issues, paragraphs 56 through 68:

While AWWA understands that the NPRM primarily address voice communications, and the associated technology issues that allow more voice channels to be provided in the same spectrum, public water suppliers have a high priority need for channels and spectrum space for data communications. Data communications can require more bandwidth than voice communications. Although some public water suppliers (PWSs) utilize multiple address systems now authorized under Part 101, a large number of these PWSs continue to use lower frequency channels authorized under Part 90 for critical data communications. We are not aware of any current or emerging technologies that would allow multiplexing users or frequencies used by public water suppliers that are compatible with these existing telemetry/SCADA uses.

As stated previously in these comments, public water suppliers have critical needs for communications with remote facilities and personnel related to public safety. These include monitoring and control of water supply and distribution facilities, voice dispatch of field personnel for repair and maintenance of equipment and facilities in both emergency and non-emergency situations, and communications with field personnel to ensure their safety while working in the field.

AWWA recognizes that the various technologies discussed in the NPRM provide for efficient spectrum use through the sharing of spectrum with other users. However, we maintain that critical use of radio communications by public water suppliers (PWSs) for service restoration, communications with field crews, and other high priority uses is a public safety issue and must be either on dedicated channels not shared by other users (as in FDMA) or must be protected as the highest priority use of shared channels (in CDMA or TDMA systems). Any of the various spectrum sharing technologies may be acceptable for non-critical PWS communications.

Comments on Spectrum Allocation, paragraphs 69 through 86:

Public water suppliers (PWSs), like all public safety entities, are located in all areas of United States, in both urban and rural areas. Utilities' area of jurisdiction and operation may be small or quite large, spanning many hundred square miles. For that reason, no single frequency band will adequately meet the needs of all water utilities. We suggest allocation of spectrum for utility use in all bands covered by this NPRM to allow each utility the opportunity to implement a communication system that most effectively meets their individual needs.

Public water supply needs for spectrum include the following:

- Multiple dedicated channels for data communications for monitoring and control of facilities as well as transmission of graphical data to field crews to facilitate the location of underground facilities (pipes, valves, meters, etc.). These channels generally require higher bandwidth than voice channels to allow data transmission at acceptable rates, however, a high number of relatively small bandwidth channels may be preferred opposed to a smaller number of high bandwidth channels for this use. Higher frequency bands (800 MHz and higher) are generally preferred for these uses because of their immunity to interference and other transmission characteristics and, if sufficient spectrum

is available, these higher frequency allocations could be used to replace some existing lower frequency data transmission systems now in use.

- Multiple voice channels for normal and emergency communications between one or more central voice dispatch locations and field crews, between and among field crews, and between the public water supply and other public safety agencies to coordinate operations, especially in emergency situations.
- Channels for implementation of automatic vehicle location (AVL) systems. These systems are becoming an important issue to public water suppliers to increase efficiency and maintain personnel safety. Channels for this use may be dedicated for this use or may be shared with other similar systems of other public safety agencies.

On the issue of spectrum allocation, AWWA suggests that the dynamic allocation of spectrum between established Radio Services when applicable. For example, spectrum needs for marine operations in mid-west locations are significantly less than coastal areas. Unused spectrum made available by such dynamic allocation could be allocated as additions to the public safety spectrum.

It is also our observation that non-public safety users of radio communications are more appropriate for shared use through any number of multiplexing technologies. Significant increases in spectrum efficiency can be realized by those methods which can provide additional spectrum for public safety uses that requires dedicated use of channels.

AWWA disagrees that commercial services are a viable option for public safety communications. Reliance on third-party service providers, motivated primarily by commercial interests, has proven to be unsatisfactory in the past for the critical communication needs of public safety agencies, including public water suppliers. Additionally, it has been previously demonstrated in times of emergency that commercial service systems have become seriously overloaded and unreliable, compromising effective use of those services.

Comments on Transition, paragraph 87:

Will a transition strategy that rests principally on obtaining additional spectrum for public safety be unacceptable because it effectively would ignore public safety agencies' more immediate spectrum needs? What would be the most reasonable plan for transition?

The transition from current spectrum allocation to new spectrum could be costly forcing agencies to migrate to more expensive radios. This may not be a realistic and affordable approach to many utility companies.

For example, telecommunications is one of many projects with the public water supplier that competes with other capital investments such as plant upgrades, improvements to meet new water quality standards and new facilities,

This spectrum range should be broad enough to utilize existing equipment but migrate to higher technologies as older technologies become obsolete. Public water suppliers may have not yet realized the total benefits of their communications systems and may have not planned to upgrade to newer telecommunications systems.

The Notice of Proposed Rule Makings (NPRM) refers to public safety as protection of life, property, and natural resources. This definition should also include public services to included municipal owned utility companies to include electric, gas, water, and wastewater and should allow agencies to recover capital equipment costs or exchange services by offering services to similar agencies.

Although current technology has increased the availability of information, the amount of information is cumbersome. Communications avenues should be improved to allow agencies to receive and respond to new programs, policies, and procedures in a timely manner. Cost effective public education programs should also be promoted to encourage public agency input.

Comments on Transition, paragraph 88

The NPRM assumes the planning process for public agencies is typically longer due to their budgeting procedures and the need to compete with other agencies for similar funds.

AWWA concurs that this fact is true and must be considered in the proposed NPRM. In addition, the planning process may be constrained due to rate or tax limitation requirements.

Comments on Increased Use of Commercial Services, paragraph 89

Essentially, any public safety agency should be allowed to select their service based on their requirements. This service could vary considerably by vendor and location. However, if a public agency does select a commercial provider, this should not limit their ability to acquire spectrum in the future. Public agencies should also have the ability to sublease their spectrum to a commercial provider for its own use under an agreement that allows the public agency to revoke the spectrum under conditions of the agreement.

Comments on Funding for Spectrum Migration, paragraph 91:

This will vary substantially from public agency to public agency. In general, this is probably an accurate statement. Relocation rules would have to be firmly established to allow for full migration from current standards to the proposed standard.

Comments on Improving Public Safety Spectrum Allocation, paragraph 93:

Every effort should be made to continually improve a proactive approach to spectrum allocation to ensure the FCC works in the constraints and limitations of public agencies. The prioritization of public agency and public service frequencies is critical due to the safety implications of the intended service.

Comments on Competition, paragraph 97:

The NPRM suggests Motorola and Ericson are the only land mobile data systems available for public agencies. As a result, the NPRM seeks comments to address what measures, if any must be taken in order to ensure that rules do not favor use of a particular technology over another.

The AWWA concurs with this statement. Every attempt should be made at encouraging open standards that promotes competition. On the other hand, this will largely be vendor defined based on the supply and demand of their product as well as user defined standards and requirements.

Comments on Competition, paragraph 100:

The FCC seeks comments on APCO Project 25. This standard needs further discussion by the FCC regarding its potential implications on water utilities.

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